

Claim 1 (currently amended) A system for measuring optical characteristics comprising:

a laser producing an excitation signal, wherein the laser is not a pulsed laser;

a first frequency generator producing a first signal and a second frequency generator producing a second signal, wherein the second frequency generator is phase-locked to the first frequency generator such that the second signal has a fixed frequency offset from the first signal;

a single-mode optical fiber coupled to the laser so that a coupled excitation signal is introduced into the optical fiber, wherein the coupled excitation signal is a continuous wave signal modulated at variable frequencies; and

a first detector positioned to receive radiation backscattered by the optical fiber in response to the coupled excitation signal.

Claims 2-7 (canceled)

Claim 8 (original) The system of claim 1, further comprising a second detector positioned to receive radiation backscattered by the optical fiber in response to the coupled excitation signal and sensitive to a different spectrum of backscattered radiation frequencies than the first detector.

Claim 9 (canceled)